

"The real test is the preparation for the test" –Joe Comito, Tang Soo Do Karate Master

Honors/Advanced Physical Science, Units 5-9

Name: _____

Date of your final: _____

Period: _____ Seat _____

Final Exam Review Sheet: Physical Science

The Final Exam is a test that covers the material since our Midterm exam and counts for **20% of the 4th marking period grade**. It includes **Units 5-9**. We will begin reviewing for the test in class every day until the test. Students should spend 30 minutes to an hour every night at home studying for this exam.

Final exam schedule:

Mon., June 7th: Periods 1 and 8

Tues., June 8th: Periods 2 and 7

Wed., June 9th: Periods 3 and 6

Thu., June 10th: Periods 4 and 5.

Units and Objectives:

Unit 5: Work, Power and Energy

Unit 6: Electricity and Magnetism

Unit 7: Waves

Unit 8: Earth Science

Units 9/10: Astronomy/ Seasons

To Prepare:

I want you to have every possible advantage to pass this exam. Therefore, I encourage you to study by doing the following things:

- 1) Complete this **review sheet**;
- 2) Read through your packet for each unit. Old tests and quizzes will give you clues about what ideas/concepts are the most important. Review these and **quiz yourself**!
- 3) Write "**Student Reflection Notes**" that summarize the material from each unit. By thinking about the information in your own words, you process it differently and you will probably have questions. Bring these questions to class before the test! I will answer questions daily.
 - a. Student Reflection Notes are due the **day of the final exam** and must be written in **your own handwriting**.
 - b. Student reflection notes are **optional**, and you may not use these on the test. **However**, if your overall grade is borderline, I can use these to round your grade up. If you do not complete the notes, there is nothing I can do to help your grade.
- 4) Practice turning objectives into questions and quizzing yourself. Put yourself into teacher shoes and brainstorm good test questions – and answers!

Unit 5: Work, Power and Energy

Vocabulary:

Kinetic Energy
Potential Energy
Force
Work
Power

Simple machine
Mechanical advantage
Joule
Momentum

1. Velocity is different from speed because it includes the _____ of motion.
2. **Fill in the four formulas:**

Formula for Kinetic Energy (KE) KE =	Formula for Potential Energy (PE) PE =
Formula for Work (W) W =	Formula for Power (P) P =

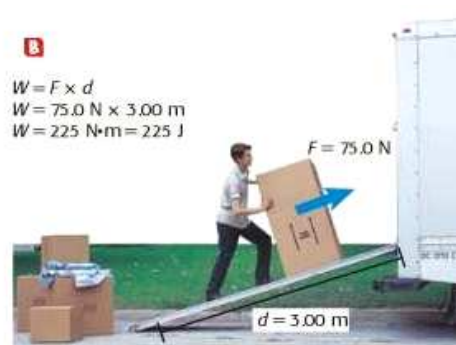
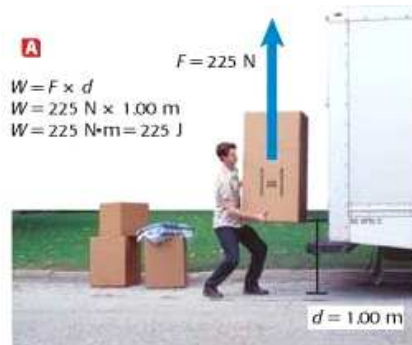
3. What is the kinetic energy of a tiger that weighs 60 kg running at a speed of 30 m/s?

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4. What is the gravitational potential energy of a 70 kg climber that goes up a 35 m mountain? (Hint: $g=9.8 \text{ m.s}^2$)
5. What is Newton's Second Law of motion? Explain it and provide the formula:
6. Explain Newton's Third Law of motion and provide a formula for it.
7. Which has a greater momentum: a 1000kg car moving 80 km per hour or a 5000kg truck moving 30 km per hour? Show your work.
8. Calculate the amount of work done when a grocery store stocker uses 120 N of force to lift a bag of flour 1.5 m onto the shelf.
9. Why are children safer in the back seat of a car than the front seat?
10. How powerful is a machine that can produce 600 Joules in 10 seconds?
11. List the six simple machines that talked about in class (and be able to identify a picture of each)

12. Looking at the picture below, identify what is different when the man decides to use an inclined plane:

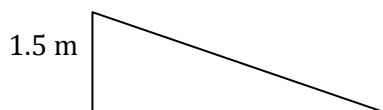
- | | |
|----------------------|------------------------|
| a. He does more work | c. He uses more force. |
| b. He does less work | d. He uses less force. |



13. An apple weighing 2 Newtons falls down a distance of 1 m. How much work is done on the apple by the force of gravity?
14. A short ramp and a long ramp both reach a height of 1 m. Which has a greater mechanical advantage?
Short ramp / long ramp

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15. **Advanced/Honors:** A ramp is 3 meters long and 1.5 meters high. What is the mechanical advantage of this ramp?



Unit 6: Electricity and Magnetism

Vocabulary

Charge of electron, neutron and proton

Attract

Repel

Conductor

Insulator

Voltage (V)

Circuit

Schematic Diagram

Charging by friction

Charging by contact

Current (I)

Resistance (R)

16. When does an atom have a net, or overall, positive charge?
- It has more protons than electrons
 - It has more electrons than protons
 - It has more neutrons than protons
 - It has the same number of protons, neutrons and electrons.
17. Draw the schematic diagrams for each of the following components:
- | | |
|--------------------|----------------------|
| <i>open switch</i> | <i>closed switch</i> |
| <i>motor</i> | <i>light bulb</i> |
| <i>resistor</i> | <i>buzzer</i> |
| <i>battery</i> | |

18. Draw a schematic diagram for each of the following circuits:

A: A circuit with a motor and light bulb in series.	B: A circuit with a light bulb and buzzer in parallel.

Ohm's Law Word Problems – Show all your work!

Steps for showing work: (1) list the givens and unknowns from the word problem, (2) choose a formula, (3) plug in the numbers, and (4) solve for an answer, (5) write the answer, with units, in the box.

FORMULAS:

Resistance = $\frac{\text{Voltage (V)}}{\text{Current (I)}}$	$V = I \cdot R$	$I = \frac{V}{R}$	Power = Voltage * Resistance
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19. A $10\ \Omega$ resistor has 0.5 A of current passing through it. What is the voltage across the resistor?

Variables

Choose the equation

Plug in #'s and solve

V =

I =

R =

Answer with units:

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20. If a lamp is measured to have a resistance of $12\ \Omega$ and a voltage of 210 V, what is the current in the lamp?

Variables

Choose the equation

Plug in #s and solve

V =

I =

R =

Answer with units:

21. A resistor has a resistance of $10\ \Omega$. How much current is in the resistor if there is a potential difference of 120 V?

Variables

Choose the equation

Plug in #s and solve

V =

I =

R =

Answer with units:

22. When a DVD player is connected across a 120V outlet, the DVD player has a 0.8 A current in it. What is the power rating of the DVD player?

Variables

Choose the equation

Plug in #s and solve

P =

I =

V =

Answer with units:

23. How much current flows through a series circuit that includes a 2 ohm light bulb, 3 ohm resistor and 9 ohm motor if it has a 9-volt battery?

24. How much current flows through a parallel circuit that includes a 2 ohm light bulb, 3 ohm resistor and 9 ohm motor if it has a 9-volt battery?

Unit 7: Waves

Vocabulary

Wave

Transverse Wave

Longitudinal/Compressional wave

Electromagnetic Radiation

Trough

Crest

Amplitude

Wavelength

Frequency

25. List the types of waves on the Electromagnetic Spectrum from low energy to high energy:

←Low Energy

High Energy→

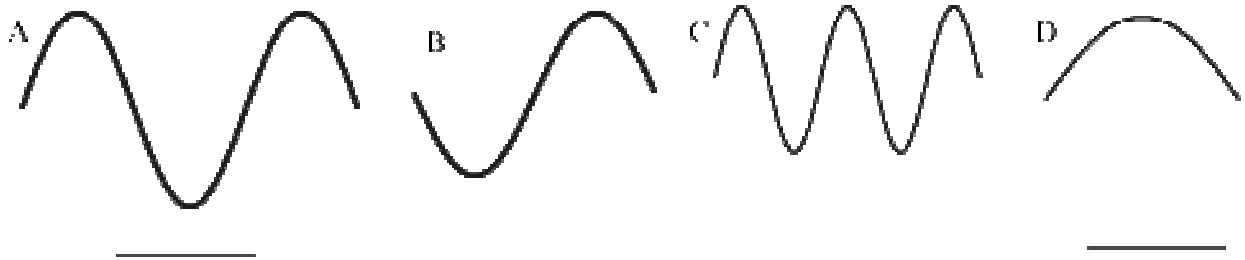
26. Draw a wave and label these: 1 wavelength, amplitude, trough, crest

27. Draw a second wave with a *shorter* wavelength. It has *higher* / *lower* energy than the first wave.

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28. Draw a third wave with a *longer* wavelength. It has *higher* / *lower* energy than the first wave.

29. Answer the 3 questions below by matching the letter of the wave that best describes it (A-D):



- a. Which of the above has the biggest amplitude?
b. Which of the above has the shortest wavelength?
c. Which of the above has the longest wavelength?

30. Seismic waves are *longitudinal* / *transverse*, just like sound waves.

31. Higher **frequency** sound waves have higher pitch / volume.

32. Higher **amplitude** sound waves have higher *pitch* / *volume*.

33. The speed of light is _____ m/s (This includes all electromagnetic radiation)

34. Higher **amplitude** electromagnetic (light) waves have higher *energy* / *brightness*.

35. Higher **frequency** electromagnetic (light) waves have higher *energy* / *brightness*.

36. What is the equation for speed of a wave?	37. What is the equation for frequency of a wave?

38. An FM radio station broadcasts electromagnetic waves at a frequency of 94,500,000 Hz . The radio waves have a wavelength of 3.17 meters. What is the speed of the waves?

39. The speed of sound in air is about 340 m/s. What is the wavelength of a sound wave with a frequency of 220 Hz?

Unit 8: Earth Science

Vocabulary

Lithosphere vs. asthenosphere
Plate tectonics
Plate boundary
Fault
Igneous rock

Metamorphic rock
Sedimentary rock
Weathering vs. Erosion
Compaction/Cementation/Lithification

40. **Describe/define** each of the four layers that make up earth's interior:

- a. Crust:
b. Mantle:

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c. Outer Core:

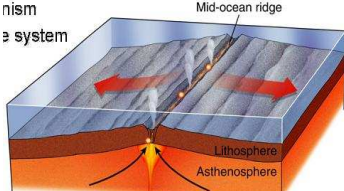
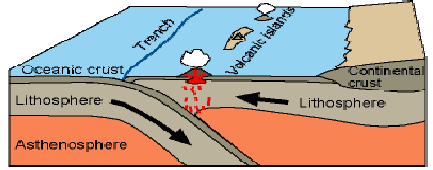
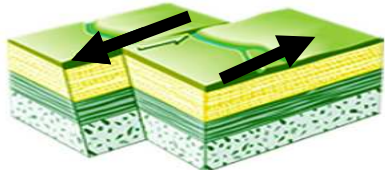
d. Inner Core:

41. Which of Earth's layers is made of liquid metal (iron and nickel)? _____
42. Which layer is made of solid metal (iron)? _____
43. Which layer is the thinnest? _____
44. Which layer(s) make up the lithosphere? _____
45. Which layer(s) make up the asthenosphere? _____
46. List three pieces of **evidence** for plate tectonics. In other words, how do we know that the lithospheric plates have moved and continue to move?

47. The "plates" that move according to the Theory of Plate Tectonics are made of which of Earth's layers?

- a. Crust c. Asthenosphere e. Lithosphere
- b. Mantle d. Outer core

In the table below, label each plate boundary, list a real-world example of each (ex: Ring of Fire), and name the fault type most commonly happens there.

		
<p>Type of boundary:</p>	<p>Type of boundary:</p>	<p>Type of boundary:</p>
<p>Real-world example:</p>	<p>Real-world example:</p>	<p>Real-world example:</p>
<p>Type of fault likely to be here:</p>	<p>Type of fault likely to be here:</p>	<p>Type of fault likely to be here:</p>

48. Because the Pacific Plate is surrounded by _____ boundaries that recycle it into the mantle, the size of the Pacific Plate (and therefore ocean) is _____.

- a. convergent, getting smaller c. divergent, getting smaller
- b. convergent, getting bigger d. divergent, getting bigger

49. The lithosphere below the Atlantic Ocean has a _____ boundary, so the width of the Atlantic Ocean is _____.

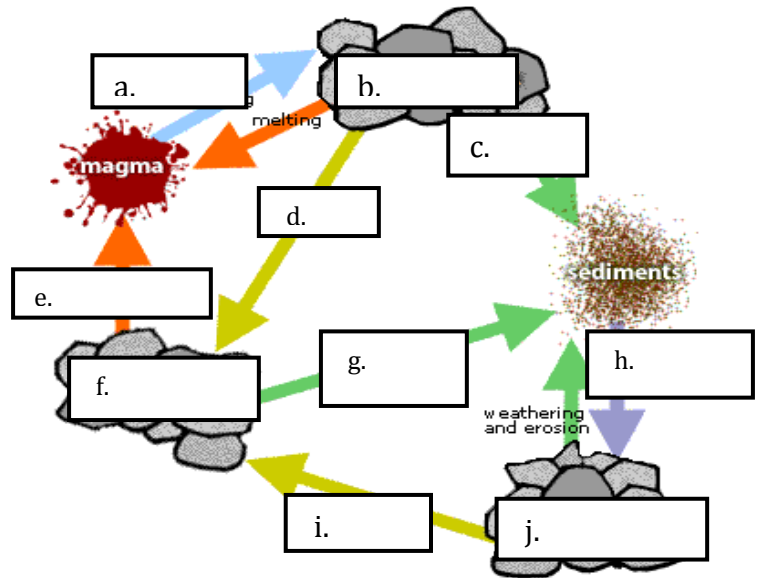
- a. convergent, getting smaller c. divergent, getting smaller
- b. convergent, getting bigger d. divergent, getting bigger

50. Earth is _____ years old.

51. Oxygen began to accumulate in our atmosphere _____ years ago.

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52. Label each step of the rock cycle:



Unit 9/10: Astronomy/The Reasons for the Seasons

Vocabulary

Troposphere
Stratosphere
Mesosphere
thermosphere

tropopause / stratopause / mesopause

Ozone layer

Smog

Longwave radiation

Shortwave radiation

Greenhouse effect

52. You breathe gas from this layer of the atmosphere: _____.
53. The natural ozone layer exists in the _____osphere, absorbs _____ radiation from *the sun / the Earth's surface*.
54. What is the name of the boundary between the troposphere and stratosphere? _____
55. A molecule that can damage the ozone layer is called _____.
56. When O_3 and NO_2 react near the Earth's surface, they can form _____, a pollutant that irritates people with asthma. Therefore, ozone in the troposphere is a *good/ bad* thing.
57. Longwave radiation has *low energy / high energy* and is emitted by _____.
58. The "Greenhouse Effect" refers to greenhouse gases absorbing *shortwave / longwave* radiation from *the sun / the Earth's surface* and therefore trapping more heat in the *troposphere / stratosphere*.
59. Since the Industrial Revolution, people have added more CO_2 to the atmosphere. Because CO_2 is a greenhouse gas, we can predict that the atmosphere will get *warmer / cooler*.
60. About how high is the ozone layer? _____
61. Which layers get **cooler** with *increasing altitude*? _____
62. What is the warmest it can get in the stratosphere? _____
63. **Sketch an illustration for each of these:**

A. Ozone layer

D. Longwave radiation

B. Ozone hole

E. Shortwave radiation

C. Greenhouse Effect

F. Volcanic ash in the stratosphere

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Unit 9: Astronomy / Seasons:

Vocabulary

Solar system

Galaxy

Gravity

Orbit

Revolve

Center of Mass

White Dwarf

Red Giant

Supernova

Fusion

64. We currently use the *heliocentric* / *geocentric* model for our solar system.

65. If gravity is pulling the moon toward the Earth, why doesn't it crash into us?

66. List the steps of a star's life and death

67. When and how will our sun die?

Unit 10: Seasons:

Vocabulary

Earth's Tilt

Tropic of Cancer

Equator

Tropic of Capricorn

68. Why do the Northern and Southern Hemispheres have seasons in the opposite months?

Current Events

69. What compound did scientists from NASA find on Mars?

70. What was happening in Iceland that effected travel in Europe this spring?

71. What is disaster is happening in the Gulf of Mexico?

72. Which Western scientist first concluded that the sun, rather than Earth, was the center of our solar system?

73. List where two earthquakes and two volcanic eruptions happened during the last year.